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ABSTRACT

This paper describes the technological, economic, demographic, and societal changes occurring in the United States, highlighting those trends particularly affecting vocational education, such as the increase in service and information occupations, the changing composition of the work force, and increased international competition. The paper next reviews recent national reports on education, focusing on what these reports say about vocational education. Because vocational education's traditional role no longer appears viable, a new role is proposed--the development of balanced occupational programs that enable students to acquire broad, transferable skills for employment and personal use. The modifications this will require in vocational institutions are outlined. The remainder of this paper describes one approach to this new mission--New York State's restructured secondary vocational curriculum. Discussed first is the process whereby the new diploma requirements and occupational education sequences were developed. Detailed descriptions of the new program include foundations in grades K-6, programs in grades 9 through 12, and occupationally related courses for general education credit. The descriptions include key skills and competencies, scheduling options, sequence requirements, and discussion of state standards and modifications in teacher education. The paper concludes with a list of items that must be included in a new agenda for vocational education. (SK)

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Information Series No. 311

New Directions for Vocational Education at the Secondary Level

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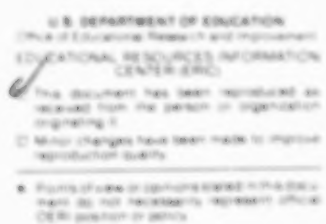

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Foreword

The Educational Resources Information Center Clearinghouse on Adult, Career, and Vocational Education (ERIC/ACVE) is one of 16 clearinghouses in a nationwide information system that is funded by the Office of Educational Research and Improvement, U.S. Department of Education. One of the functions of the Clearinghouse is to interpret the literature in the ERIC database. This paper should be of particular interest to state and local educational administrators and policymakers, and to vocational education teachers and curriculum specialists.

The profession is indebted to Willard R. Daggett and James A. Kadamus for their scholarship in the preparation of this paper. Dr. Daggett is Director of the Division of Occupational Education Programs, New York State Education Department. In this capacity he is responsible for coordination of the state's instructional programs in agriculture, business, health occupations, home economics, industrial arts, marketing, technical, and trade and industrial education. He is presently serving as chairperson of the National Curriculum Committees of the Data Processing Management Association and Professional Secretaries International.

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The National Center wishes to acknowledge the leadership provided to this effort by Dr. Robert E. Taylor, recently retired Executive Director. Recognition is also due to Harley S. Schlichting, Director of the Instructional Materials Laboratory, University of Missouri-Columbia; Richard A. Baker, Head, Department of Vocational and Adult Education, Auburn University; and to Joel H. Magisos, Associate Director of the International Division, and Frank Pratzner, Senior Research Specialist, the National Center for Research in Vocational Education; for their critical review of the manuscript prior to publication. Wesley Budke and Susan Imel coordinated the publication's development, assisted by Sandra Kerka and Cheryl Harrison. The manuscript was typed by Clarine Cotton, Jean Messick, and Sally Robinson; Janet Ray served as word processor operator. Christine Strommen of the National Center's Editorial Services edited the paper.

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Executive Summary

Vocational education in the United States was conceived and developed in response to the needs of an industrial society. Today, vocational education exists in an information society. Education must respond to the major changes that are transforming society, including the following:

- The shift in jobs from manufacturing to service and information
- The necessity to compete in a global economy
- Workers' needs for adaptable, transferable skills
- The need for technological literacy
- The effect of demographic and social changes on the family
- The need to address equity for all groups

In addition to these challenges, education must respond to pressures arising from the national reports on educational reform. Vocational education in particular must modify or restructure existing programs to meet the changing needs of society.

This paper describes the technological, economic, demographic, and societal changes occurring in the United States. Among the highlighted trends affecting education are the following:

- The predicted increase in the lowest paying/lowest skilled service occupations as well as in information occupations
- The fact that human resources and information are becoming the driving forces of productivity
- The changing composition of the work force in terms of age, geographic location, and sex
- The need to transform the U.S. economy to one based on flexible system production in order to maintain a competitive advantage

The paper next reviews the national reports on education such as *A Nation at Risk* and *The Unfinished Agenda*. On the whole, these reports recommend providing all high school students with a core curriculum, strengthening curriculum requirements, eliminating tracking, improving teaching, and developing public/private partnerships. These reports have been criticized for dealing primarily with the 25 to 30 percent of high school students heading for college. Those reports

that do address vocational education, in particular *The Unfinished Agenda*, recognize the need to develop more productive workers by focusing on such areas as personal skills and attitudes, communication skills and technological literacy, employability skills, occupational skills and knowledge, and career planning and lifelong learning. Among the keys to achieving this goal are collaboration between vocational and academic programs, emphasis on equity as mandated in the Carl D. Perkins Vocational Education Act, the development of federal and state program standards, and strong leadership at all levels.

The mission of vocational education clearly needs to be redefined. Its traditional role—training a high school student to do a specific job—is no longer viable. This paper proposes a new role for vocational education—the development of balanced occupational programs that enable students to acquire, in addition to job-specific skills, broad, transferable skills for employment and personal use that will help them adapt to changing workplace requirements and benefit from lifelong education and retraining opportunities. The most unique aspect of vocational instruction—"hands-on" learning will be a major asset in this new curriculum. Vocational education can integrate academic concepts and teach them through vocational applications.

This new direction will require modification in vocational institutions and delivery systems, including—

- a decrease in emphasis on specialized training;
- less expenditure on specialized equipment and more on staff development;
- change in emphasis from trade and industrial to information and service occupations;
- new linkages with business and industry; and
- a closer relationship with general education for a coordinated, integrated curriculum.

The new mission for secondary vocational education that is outlined in this paper is being put into practice in New York State. The details of the state's restructuring of its vocational education curriculum are delineated. New diploma requirements state that students must complete 18 1/2 units of credit. In addition, they must complete one of the following: two 3-unit sequences or one 5-unit sequence from among occupational education, mathematics, science, second language, art and/or music; or one 3-unit sequence in the above disciplines and one 5-unit sequence in either English or social studies.

The foundation for the new program is laid in grades K-6, where the core skills of keyboarding and computer literacy have been integrated into the elementary school curriculum. In grade 7 or 8, students must complete a three-quarter unit in Home and Career Skills, designed to prepare them for adult responsibilities by developing decision-making, management, and basic life skills. The other new requirement is the completion of a unit in Introduction to Technology by the end of grade 8. This program emphasizes understanding of systems of technology in the home and workplace.

All students following an occupational education sequence must complete at least one unit in Introduction to Occupations, which includes career awareness exploration, job readiness, personal resource management, workplace citizenship, and a series of optional modules in specific occupational areas.

In grades 11 and 12 the occupational education program permits concentration on one or more occupational clusters and development of entry-level job skills. New sequences are being designed for all occupational areas to ensure the development of transferable and job-specific skills, but also to allow local schools the opportunity to organize their course offerings in a variety of ways.

The paper includes detailed descriptions of the key skills and competencies, scheduling options, and sequence requirements of the new program, as well as discussion of state standards and modifications in teacher education. The paper concludes with a list of items that must be included in a new agenda for vocational education. A major restructuring of vocational education should include the following elements:

- A new vision of vocational education as an integrated part of the overall education program for all students
- A series of core skills that can be delivered through a coordinated vocational curriculum
- A comprehensive inservice program and upgrading and expansion of teacher education programs
- The use of traditional vocational teaching techniques such as hands-on learning experiences
- A major public awareness effort to demonstrate vocational education's role as a program that develops broad, transferable skills as well as job-specific skills

Information on vocational education curriculum reform may be found in the ERIC database under the following descriptors: *Curriculum Development, *Educational Improvement, *Educational Quality, Institutional Role, Relevance (Education), *Role of Education, Secondary Education, *Secondary School Curriculum, State Curriculum Guides, State Standards, *Vocational Education. Asterisks indicate descriptors having particular relevance.

Introduction

Vocational education in America is at a crossroads: The decisions made in the immediate future in regard to a series of challenges from within and outside of the education community will determine whether vocational education can continue as a viable program.

Vocational education was conceived and developed in the United States in response to the needs of an industrial society. The society in which vocational education now exists, and shall continue to exist throughout the remainder of the century and beyond, is a technological or information society. This society has a much different set of characteristics than did the industrial society on which vocational education programs are based. Although these characteristics are multilateral in nature, they center on six major changes in society to which education must respond.

First, in the industrial society, the majority of jobs were in manufacturing, production, and the trades. It is estimated that more than 73 percent of all jobs are now in information and service occupations, whereas just 20 years ago less than 25 percent were in these categories.

Second, during the industrial era when economies were based on regional or national needs, the United States led the world in economic terms. As the country has moved into a technological age, it has also moved into an economy with global characteristics and needs. Unless the United States learns to deal in this enlarged arena, it will lose its competitive advantage. In *The Next American Frontier*, Reich (1983) puts it this way:

> As the rest of the world progresses, we must also progress if we are to retain our role of economic leadership. . . . We cannot continue to rely on high-volume, standardized industries after other countries have become better suited for them. . . . The industries that will sustain the next stage of America's evolution will necessarily be based on a skilled, adaptable, and innovative labor force and on a more flexible, less hierarchical organization of work. (p. 13)

Third, in making the transition into a global economy, the most important resource for American business and industry is no longer capital, but human resources. Workers will need to be well trained and able to adapt to a wide variety of challenges that they will encounter at an ever-increasing rate. The skills and competencies that the vocational education system instills in students must be substantially different than those taught when highly specialized vocational programs were needed to meet the needs of an industrial society.

The use of technology is having an impact on workers at all levels—on the factory floor, in the back office operations of service companies, and in the ranks of management staff. Technology is changing both what people do on the job and how it is done. Preparing workers to meet the challenges of technology in the workplace is the fourth change to which education must respond.

Pratzner and Russell (1984) have coined the expression "sociotechnical literacy," which goes beyond technological literacy to address both the human and technical dimensions of work and their interactions. Such skills as working effectively in groups, problem solving, and decision making assume greater importance as work settings become less hierarchical and more participative.

In addition to the technological and economic changes taking place in America, demographic and social changes are also challenging our national framework. These must also be taken into account in order to determine in what direction education programs must proceed. Specifically, the fifth major alteration is occurring in society's basic component, the family. In the industrial society, the typical family unit was comprised of a father, mother, and children. Demographics now indicate a marked increase in homes that are headed by a single parent. The impact of this development on the educational system can be neither underestimated nor ignored.

The final challenge to the nation as it moves into a technological society revolves around the issue of equity. In industrial society, limitations were put on the roles of various ethnic groups as well as the roles of females and males. Most individuals and institutions are now sensitive to equity issues, including those related to the needs of the handicapped and disadvantaged. However, further attention must be given to the inequities that still exist in order to benefit society in general.

Education must respond not only to these challenges facing society as a whole, but also to pressure from within the education community itself. Many national reports, including *A Nation at Risk* (National Commission on Excellence in Education 1983) and *The Unfinished Agenda* (National Commission on Secondary Vocational Education 1984), have pointed to the need for new school requirements. To remain viable, vocational education must either modify existing programs developed in response to the industrial society or restructure them, acknowledging the United States' evolution into a technological/information society.

In addressing the American Vocational Association Convention in December 1985, U.S. Secretary of Education William J. Bennett stated that in order to meet the changing needs of society and students, education must "stake out a sensible middle ground" between academics and trade skills. He urged the education community to adopt a "solid academic curriculum" that places greater emphasis on "broad career skills" than on "job-specific training." The teaching of "general knowledge, and worthy values and habits" was also emphasized by Mr. Bennett.

This paper addresses the issues confronting vocational education. It describes in more detail the technological, economic, demographic, and societal changes occurring in the United States. It also reviews the recommendations of the many national reports on education that were prepared in the first half of the 1980s. Taking the results of this scrutiny into account, within the broader national social and economic context, the paper presents a revised mission for vocational education. It is a mission that broadens the scope of vocational education programs and makes them more appropriate for the needs of business and industry and more valuable to students. Theory has been put into practice in New York State through a restructuring of its vocational education system. The details of this restructuring process and the new program directions that emerged from it are delineated. Descriptions of key skills and competencies, scheduling options, and sequence requirements are included in the appendices. The paper concludes with a listing of items that must be considered when undertaking the task of transforming vocational education programs to make them compatible with the needs of today's society and adaptable to its changing requirements in the future.

The Changing Social and Economic Context

From the Industrial Age to the Technology/Information/Services Economy

The U.S. economy is undergoing a transformation that is as significant and revolutionary as was the shift from an agricultural to an industrial society. The United States is entering an age in which technology/information/services dominate. To illustrate this change, consider the fact that in 1960, 73 percent of jobs were in the trade and manufacturing sector. By 1983, the proportion of jobs in that sector of the economy had shrunk to 23 percent, while information and service occupations accounted for 73 percent of jobs (Daggett 1984).

Technology itself is bringing about rapid changes and its impact is being felt in all areas of the economy. Within the manufacturing sector, the "smokestack" industries such as textiles, steel making, and automobile producing are being replaced by "high tech" industries involved in biomedical engineering and microelectronics, for example. Those heavy industries that continue to thrive have done so through increasing use of automated production.

The accelerating rate of industrial change resulting from automation, robotics, and widespread computer use is dramatically altering the needs of business and industry and the composition of the U.S. work force. Workers are being displaced, losing their livelihoods as industries fail or move to other countries. The federal government estimates that by 1990, between 17 and 19 million new jobs will be created; 13 million of these will be in "white collar" professions (Martin 1984). This shift of employment opportunities points up the growing need to prepare entry-level employees with quite different skills than in the past and to initiate widespread retraining programs for displaced workers.

Although economists and public policymakers continue to debate how the total occupational picture will look in the 1990s, there is general agreement regarding the growth of the service sector, also known as "service-producing industries." This sector includes jobs in health, education, real estate, insurance, finance, entertainment, auto repair, and government, among others. Some of these jobs require considerable knowledge, education, and training; others do not. The U.S. Bureau of Labor Statistics (BLS) reported in 1984 that of the 10 occupations expected to produce the largest number of new jobs in the current decade, six are among the lowest paid/lowest skilled occupations: nurses' aides/orderlies, janitors, sales clerks, cashiers, fast food workers, and waiters/waitresses. Other fast-growing service occupations—for example, physical therapists and speech and hearing clinicians—require substantial postsecondary education.

The information industry is the principal employer in North America today and will continue to be so for the next 10 years, according to Snyder and Edwards (1984). The BLS projects that more new positions for secretaries, typists, and office clerks will be created in the 1980s than for

any other occupation. The other leaders in the fastest growing jobs category identified by the BLS are also information occupations: paralegal personnel, computer operators, and systems analysts. Economists, computer programmers, and employment interviewers will also be in high demand for the remainder of the decade.

Equally important is the fact that nearly all jobs will require workers to know how to use information systems. The introduction of computer-aided design (CAD) and computer-aided manufacturing (CAM) demonstrates how even the most traditional jobs in the manufacturing and production sectors will require workers to enter, manipulate, store, and retrieve data. Thus, the shift to the information or technological society is demanding new skills of workers in all sectors of the economy.

From Capital Resources to Human Resources

With the movement in the U.S. economy away from an industrial and manufacturing base to an information and services base comes a shift in the resources most valued in the marketplace. The industrial era was characterized by the dominance of raw materials and machinery; capital resources were of primary importance. In the emerging post-industrial economy, the driving forces of productivity are human resources and information. Human intelligence has become the strategic resource in this new economy based on information. This development may prove very beneficial. According to a Massachusetts Institute of Technology study (Snyder 1984), about 70 percent of all measurable improvements in productivity in the United States in this century has been due to a continuous process of suggestions and modifications made by workers, supervisors, and managers; less than 30 percent has been due to capital acquisitions. Education shoulders a major responsibility for preparing human resources with the skills needed to function successfully in the new economy.

Demographic Patterns

The population of the United States is getting older. The median age continues to rise, from 30.6 years in 1982 to a projected 36.3 years in 2000 (Cetron 1985). At the same time, the number of households with children and, therefore, the school-age population continue to decline in relation to the population at large, the result of later marriages and lower birthrates.

The distribution of the U.S. population is shifting as people continue to migrate from the Northeast and Midwest to the Southeast and Southwest in search of jobs, sun, and lower heating bills. Immigration also plays a role. For the period 1977 through 1979, the number of immigrants entering the United States in each year surpassed the number that has been admitted in any similar period since 1924. Older metropolitan school districts are especially affected by declining enrollments, shifts in demographic qualities, and everpresent financial problems.

The composition of the work force is changing as more women become employed outside the home. In 1960, only 33.3 percent of all women were so employed. By 1980, the total had climbed to 51 percent, and it is projected that 73 percent of the adult female population will be employed outside the home by 1990 (Daggett 1984). Currently, two-thirds of all newcomers to the workplace are women, and the participation of adult males is dropping, due in part to the obsolescence of their job skills.

It should be noted that demographic projections can be made with considerably more certainty than other forecasts of the future. While technological predictions are thought to be accurate 5 to 10 years into the future and economic forecasts are reliable for about 90 days, demographic projections are generally reliable for 10 to 15 years. Levitan (1984) points out that "Forecasting the labor force in 1995 is relatively safer than other predictions. Barring a catastrophe, the supply of labor that will be available in 1995 is already here, even if some are still in kindergarten. About five out of every six people who will be in the workforce in 1995 are presently working or looking for jobs" (p. 82). These demographic projections point out the need to reeducate and retrain the existing work force to meet the demands of a changing labor market.

Toward a Global Economy

More than ever before, the United States is operating in a global economy, where it is encountering increasing international competition. In the past, U.S. goods were competitive in the world market because of superior research and development, continuous innovation, and a highly educated and skilled work force. Now U.S. goods battle for market share with goods produced in countries where wages and the costs of many raw materials are significantly lower. Such industries as electronics, aerospace, pharmaceuticals, steel, agriculture, textiles, and chemicals are struggling to remain competitive in the international market. Reich (1983) points out how foreign trade has grown in its influence on the U.S. economy in the last 20 years:

> Prior to 1965, foreign trade did not figure significantly in the U.S. economy. Only a small proportion of American-made goods were traded internationally, an equally small amount of foreign production entered the United States. . . . By 1980 more than 70 percent of all the goods produced in the United States were actively competing with foreign-made goods. American producers have not fared well in this new contest. (p. 121)

Reich believes that to regain its leadership position in the global economy, the American economy must be transformed from one based on standardization and high volume to one based on flexible system production. Flexible system production emphasizes products that require precision engineering, testing, and maintenance, products that are custom-tailored to buyers' specific needs, or products that are technology driven. All three product categories depend on the skills of workers, which Reich feels should be the focus of the United States' economic transformation. U.S. workers will need to be more highly trained than at present if the Nation is to continue to compete successfully in the worldwide marketplace.

How Education Is Responding to Societal Changes

The changing context of U.S. society, related economic problems, and concerns about the competence of high school graduates have led many task forces, national commissions, and other interested parties to examine the educational system in the United States and to recommend ways for improving it. In the first half of the 1980s, numerous reports on what was wrong and what was right in education were published. Focusing this much attention on education, the second largest industry in the United States, is a healthy development. The same sociological forces that affect society affect the educational system, and public schools must adapt to changes in population, national priorities, and national industries and prepare themselves for the future. By the early

1990s, education will be the United States' largest industry, according to forecasts of student populations for grades kindergarten through 12 and postsecondary, vocational/technical, employee, and continuing education programs.

Within the last 5 years, more than three-quarters of the states have also initiated major studies or commissions aimed at bringing excellence and equity to their educational systems. All over the country, states and local communities are revitalizing their efforts toward helping students achieve greater mastery of reading, writing, and computational skills and are making schools more accountable through testing to ensure that students acquire necessary skills and knowledge. At the same time, they are providing special programs to assist handicapped and disadvantaged students, and are working toward sex equity in schools. Some of the impetus for the states to improve the quality of public education has come from concerns of the business community and colleges regarding the deteriorating skills of high school graduates; some has come from the desire to attract high technology industries by increasing the supply of high quality human resources. Whatever the motivations, the U.S. education system is at a crossroads. The directions taken now will determine how well the United States will perform, both domestically and in the world arena, in the decades ahead.

The next section of this paper briefly describes some of the general findings and recommendations of these national reports and what they said about vocational education specifically. This general overview is followed by a more detailed discussion of the one national report that focused exclusively on secondary vocational education, *The Unfinished Agenda* (National Commission on Secondary Vocational Education 1984).

Reviewing the National Reports on Education

What the Reports Recommend

The appearance of numerous investigative and prescriptive reports on the current state of education in the United States, especially in high schools, may give this country an important opportunity to make substantial improvements in its public and private school systems. Although the reports cover a broad range of concerns from a variety of perspectives, a set of recommendations common to many of the reports did emerge. The recommendations most relevant to the discussion here are as follows:

- Provide all high school students (college bound, in general education, and in vocational education) with a "core curriculum" that includes basic skills in reading, writing, computing, communicating, and reasoning
- Strengthen curricular requirements, especially in English, mathematics, science, social studies, technology/computer science, and often foreign language, music, and art
- Develop new partnerships between the public and private sectors to provide sustained support for education
- Eliminate tracking of students to ensure access to quality education for all
- Expect more of students and implement measures to assess performance
- Establish clear goals and improve the leadership needed to attain them
- Improve teacher preparation, performance, respect, and rewards

In most of the reports, excellence is equated with higher standards within the general academic program. At the same time, the reports also recommend greater access to quality education, including math, science, and computer courses, for minority students, for girls, and for students with handicapping conditions. Unfortunately, many reports are silent on how to deal with the inherent conflict between raising standards and increasing access.

Other shortcomings of the reports include their failure to deal in sufficient detail with the changes in technology, the business world, and the work force, all of which will have a significant impact on today's students. The reports also neglect the needs of those adults who will need to be reeducated and retrained every 5 to 10 years in order to meet the changing technological demands of the workplace. As Cetron (1985) points out, "Public schools will be an important base for this learning" (p. 126).

The failure of the reports to take a visionary approach can be seen in the suggestions made for improving education. Where the reports do offer solutions to problems in the educational system, these solutions are, for the most part, proposed within the framework of the traditional programs, rather than establishing new directions or recommending substantial reorganization of existing systems. It may be, however, that improving the preparation of students, especially those not bound for college, will require major changes in what is taught and when and how it is taught.

What the Reports Say about Vocational Education

Most of the reports pay little attention to the need for vocational preparation for the 80 percent of students who never complete a college course of study. Magisos (1984) summarizes the comments on vocational education from those studies that do consider it. He reports that Goodlad (1984) in *A Place Called School* sees general vocational education as an important part of the secondary school curriculum but criticizes it for not keeping pace with new technology and for not being rigorous enough. In *A Nation at Risk*, the National Commission on Excellence in Education (1983) recommends vocational education as an important elective. Boyer's (1983) *High School* recognizes that many people believe that vocational education holds students in school, but expresses disappointment in its job placement record. Boyer opposes placing students on a vocational track and characterizes vocational education as often irrelevant or inadequate. While putting emphasis on the need for a trained work force, the Task Force on Education for Economic Growth's *Action for Excellence* (1983) fails to mention vocational education. However, the Task Force's sponsor, the Education Commission of the States, had previously issued a strong policy recommendation favoring secondary vocational education. In *Educating Americans for the 21st Century*, the National Science Board Commission (1983) favors improvement in technological literacy but is against job skills training at the high school level. Similarly, Adler's (1982) *Paideia Proposal* includes preparation in basic skills for future careers as an objective but opposes vocational skills training in any form (Magisos 1984).

In its 1985 report, *Investing in Our Children: Business and the Public Schools*, the Committee for Economic Development lists 10 imperatives for guiding reform in the public schools: (1) educational priorities should be better defined, and resources should be invested where the payoffs will be high; (2) employability requires problem-solving skills, command of the English language, self-discipline, and the ability to acquire and apply new knowledge; (3) the central purpose of education is to develop the potential of every student, regardless of race, sex, or physical handicap; (4) teachers are professionals; they should be held to high standards and rewarded accordingly; (5) parents are a critical component of successful public schools; (6) greater trust should be placed in the initiative of individual schools, with teachers and administrators having increased decision-making power; (7) states should refrain from excessive regulation, centralization, and control of schools. But they should set standards, monitor achievement, and intervene if schools fail to perform; (8) a new coalition of business, labor, and civic leaders along with parents, educators, and school boards is needed; (9) education research and development and its effective utilization should be given greater emphasis; and (10) business should make a long-term commitment to support the public schools.

One national study that did not overlook the importance of vocational education in high school is *Education for Tomorrow's Jobs* (Sherman 1983). This report, the work of the Committee on Vocational Education and Economic Development in Depressed Areas and several other groups, focuses on the ways vocational education can be improved to enhance the employability of its graduates. The report is based on the premise that the public education system in the United

States has responsibility for ensuring that youngsters are prepared for both employment and further education. "All too often preparation of college-bound high-school students has . . . taken precedence over preparation for employment, with the unhappy result that vocational education students have inadequate basic and occupational skills" (p. 67).

Education for Tomorrow's Jobs defines the knowledge and experience that are important for vocational education students as mastery of basic educational skills, exposure to a variety of occupations, mastery of the basic occupational skills, adoption of appropriate work habits, and participation in a well-supervised work experience that is closely related to the school studies. This last recommendation receives special emphasis in the report, which found that a high school diploma offers no reasonable assurance to employers that the graduate possesses the basic attitudes essential to good work habits. Supervised work experience programs are highly recommended to help mitigate this problem. Such endeavors are part of an expanded collaboration between education and the private sector, a recommendation that is made by many of the national reports.

The definitive National report on secondary vocational education is *The Unfinished Agenda* (NCSVE 1984). This report identifies the strengths and examines the problems in today's vocational programs. When it comes to solutions, the report offers suggestions based on what is in the best interests of students. This report is considered in detail below.

The Unfinished Agenda

The Unfinished Agenda: The Role of Vocational Education in High School is the work of the National Commission on Secondary Vocational Education, which was formed in January 1984 to examine the role and functions of secondary vocational education in light of the changes occurring in United States society and the recommendations of National reports on the condition of education. This report takes issue at the outset with the demands of the other reports for increasing the number of academic courses required for graduation. "The assumption is that more academics, which may be the best preparation for college, is the best preparation for life. This assumption is wrong" (p. 1). Approximately 80 percent of jobs in the United States do not require a college degree, yet most of the national reports have dealt primarily with the 25 to 30 percent of high school students heading for college. As Cetron (1985) points out, "The reports discuss how to produce a better college student, but say little about how to produce a more productive worker" (p. 126).

As a statement of purpose, *The Unfinished Agenda* believes that "vocational education should be concerned with the development of the individual student in five areas: (1) personal skills and attitudes, (2) communication and computational skills and technological literacy, (3) employability skills, (4) broad and specific occupational skills and knowledge, and (5) foundation for career planning and lifelong learning" (p. 3). These areas are not, of course, the exclusive province of vocational education, but vocational education does have responsibility for providing both a general education and a specialized education for students. The narrow view of vocational education as a vehicle for occupational training must be expanded to include a broader mission of enriching the entire educational experience of students.

"Vocational education is both a body of knowledge and an educational process, but the educational process has not received the degree of attention it deserves" (NCSVE 1984, p. 4). As an educational process, vocational education can promote problem solving, analytical skills, use of scientific inquiry and reasoning, appreciation of the implications of technological development.

understanding of the fundamentals of the U.S. economic system, and reinforcement of communication and interpersonal skills through small-group learning activities. For some high school students, vocational education also provides first-hand knowledge of the world of work through cooperative placements in the workplace. For many students, vocational education makes academic work meaningful and goal-oriented, thus motivating them to remain in school and graduate. In addition, vocational education's potential to respond to diverse learning styles has not yet been fully explored. Some of this potential resides in the "hands-on" approach of this educational process. Individualized instruction wherein a student can progress at his or her own rate is another example of how vocational education can adapt to the needs of students.

Like some of the other national reports on education, *The Unfinished Agenda* calls for a collaboration between vocational and academic programs in order to achieve a balanced, integrated secondary curriculum. "All students, whether college bound or not, need a mix of both academic and vocational courses and enough elective options to match their interests and learning styles" (p. 2). Collaboration between vocational and general education would also help to correct the traditional perception of vocational education—that it prepares students for low status jobs. "We should provide vocational experiences for all learners and not stigmatize such courses as the exclusive preserve of special groups" (p. 12). Furthermore, schools should not provide separate tracks that lead to distinct diplomas.

"The 1984 Carl D. Perkins Act amending the Vocational Education Act of 1963 emphasizes equity in vocational education—providing relevant training for the disadvantaged, reducing sex stereotypes by enrolling students in nontraditional programs, and serving 'special' populations more effectively" (p. 11). This federal mandate addresses an area where *The Unfinished Agenda* finds much work remains to be done. Students with handicapping conditions are enrolled in limited numbers in vocational education programs, mostly in entry-level or general work experience classes. "Meanwhile, sex-linked enrollment patterns in vocational courses resist most efforts to change them—males still are found mostly in such areas as trade and industrial, and females in office and clerical. These gender biases reflect ingrained societal attitudes held in the family and the workplace" (p. 11). Vocational education and guidance need a continuing effort to redress issues of sex bias and equity. Enormous inequities also exist between affluent suburban high schools and less affluent inner-city and rural schools. Communities with up-to-date equipment provide students with learning opportunities not available in less wealthy districts. "Of greater concern, affluence apparently correlates with commitment. Thus, the students working with the best equipment are being taught in a system that is more committed to their vocational education" (p. 11).

The Unfinished Agenda acknowledges the need for federal and state program standards to ensure the quality of local vocational programs and the need for accountability measures to assess compliance with standards. The report is concerned, however, that such measures do not assess instructional quality or student achievement. "If evaluation processes are to provide useful data for local program monitoring and improvement, they must include information on what goes on in the classroom and how students are affected" (p. 16). The Research and Policy Committee of the Committee for Economic Development (1985) pinpointed a similar concern in its report, *Investing in Our Children*: "Reform is most needed where learning actually takes place—in the individual school, in the classroom, and in the interaction between teacher and student" (p. 5). On the subject of student achievement tests, *The Unfinished Agenda* considers education's role as helping students achieve personal, intellectual, social, and career goals. "Achievement tests measure student success in only one small area of one of these goals; they should be only one small part of the student's performance assessment" (NCSVE 1984, p. 17).

Many of the national reports on education included the need for strong leadership among their recommendations for improving education. *The Unfinished Agenda* also sees leadership as an issue for vocational education. "State vocational educators, in too many cases, have relied excessively on federal regulations as a substitute for developing a comprehensive educational philosophy" (p. 19). The results of this lack of strong and creative leadership are reflected in inadequate state funding of vocational education in some states, inequitable opportunities for all students to pursue vocational education, and adherence to policies and standards that, while relevant, do not assure quality vocational education. At the local level, the value placed on vocational education by school administrators and the board of education is reflected in the quality of the programs in the district. "Generally, where principals view vocational education positively and as equal in importance with academic education, more up-to-date and better quality programs exist. Conversely, where principals view vocational education programs as 'dumping grounds,' the quality of programs is poor" (p. 19).

Teacher education is another important issue for vocational education, as it is for education in general. *Achieving Excellence in Vocational Teacher Education* (1986), a compendium of five state-of-the-art papers, is one resource that addresses this topic.

The next section of this paper describes the ways in which vocational education programs can respond to the changes occurring in U.S. society and to the recommendations of the national reports. It begins with a brief history of vocational education in order to illustrate how program development has evolved over the years. The paper then proposes a new role for vocational education, one that will expand vocational education and bring relevance and excellence to programs.

Redefining the Mission of Vocational Education

The Traditional Role of Vocational Education

Throughout its history, vocational education has had the mission of teaching students job specific skills. Since the first federal legislation was passed in 1917, vocational education has been a partnership between the federal government and state and local governments. The role of the federal government has been (1) to promote economic development through a trained work force, and also, more recently, to enhance equity and services to special populations and (2) to build capacity in vocational programs by providing technical assistance and related support. Each state generates a plan that spells out the state's priorities and the uses it will make of federal dollars. The U.S. Secretary of Education has the job of ensuring that this money is spent on the national priorities and problems specified in the current Vocational Education Act by Congress. Eight percent of all funds spent on vocational education are provided by the federal government.

The relationship between the federal government and the states causes the use of funds to be circumscribed and has led to the development of highly specialized vocational education programs in the United States. These boundaries have fostered separation and hindered coordination and articulation with academic education and other programs. Technical schools and area vocational centers that house highly specialized equipment have been created. Teachers are hired because they have technical expertise in a specific occupational area. Even the establishment of support groups such as local business/industry advisory councils has been based on the ability of members to identify the particular skills needed for immediate employment in the local community.

This traditional role of vocational education—training a high school student to do a specific job—runs counter to the recommendations of the national reports, which call for a coordinated curriculum that emphasizes the development of basic skills and thinking processes in order to prepare students for a variety of occupational possibilities. "A major responsibility of schools in the future will be to prepare students to enter a rapidly changing job market" (Cetron 1985, p. 2). Traditional vocational education programs often do not offer students such preparation.

A New Role for Vocational Education

The new role of vocational education being proposed in this paper calls for the development of balanced occupational programs that enable students to acquire broad, transferable skills for employment and personal use, as well as job-specific skills. In its new role, vocational education would provide students not only with minimal, entry-level job skills but also with the basic skills that will enable them to adapt quickly to the changing requirements of new technologies and to

benefit from lifelong education and retraining opportunities. In a 1983 study, Pratzner and Russell found considerable support for the view "that vocational education at the secondary level should be integrated better with general education and that emphasis should be on the development of broadly applicable skills" (p. 45). As noted by Cetron (1985) this balanced program will enable vocational education to prepare students for careers of challenges and changes, not just for a first job.

Among the most important of the broad, transferable skills needed by vocational education students are (1) knowledge of the systems of computers and technology, (2) problem-solving and decision-making skills, (3) resource management skills, (4) understanding of the economics of work, (5) applied math and science, (6) career and personal planning skills, (7) interpersonal skills, and (8) data manipulation skills. Personal flexibility, founded on and developed through acquisition of these basic skills, will be a passport to job and career growth as the changing requirements of the workplace force employees to update and retool job skills continually through training, retraining, and education.

This new role for vocational education will require changes in what is taught in vocational courses but no radical change in how knowledge is imparted to students. The curriculum will become more academic in nature, but the most unique aspect of vocational instruction—the use of "hands-on" or applied learning—will remain intact. In *A Place Called School*, Goodlad (1984) pointed out that the subjects initially most popular with students are the arts and physical education, hands-on activities that engage the student actively. Their popularity is repeated in high school by vocational subjects (Gross 1983). Vocational education programs can integrate academic concepts and teach them through vocational applications, thus fulfilling the recommendations of the national reports to provide all students with certain basic skills, while maintaining the instructional method that has been found to increase educational performance and achievement substantially—"real-world applications of classroom knowledge" (Snyder 1984, p. 19).

The formulation of a new mission for vocational education will present a direct challenge to many aspects of the vocational education system. The roles of the various institutions in which vocational education has traditionally been delivered will need to be redefined. Investment in specialized equipment will be de-emphasized in favor of the development of equipment that can be used in a variety of programs to teach broad, transferable skills. As vocational education incorporates more academics, new instructional and reference materials will be needed both in the classroom and for homework assignments. A major staff development effort will be required in order to provide teachers with training in enlarged and new areas of responsibility.

Changes must also be made in the vocational courses offered to students. To keep pace with the transformation of the U.S. economy from an industrial base to an information/services base, vocational education must move away from its major emphasis on trade and industrial occupations. Preparation for service and information occupations will move to the forefront of vocational education. Even students preparing for careers in industry and agriculture will need to acquire skills in the areas of information and technology. One result of this changing emphasis may be a shifting of portions of programs out of area vocational centers and back to the local comprehensive high schools, a move in keeping with the recommendations of several national reports. Accompanying this change may well be a shifting of some new "academic" programs out of local schools to area centers.

Area vocational centers were developed in response to the need for specialized resources—primarily equipment—required for jobs in the industrial society. The technological or information society still has the need for specialized resources but the emphasis has moved from equipment to

human resources. Therefore, the area centers' role of providing specialized resources will remain, but instead of having specialized equipment available for a few students over extended periods of time, centers will provide a specialized staff, with some equipment, for more students for shorter periods of time. Students served will include those whom the centers have accommodated in the past as well as others, including general education students, who have not traditionally attended area centers. It appears then that the area vocational centers will experience increased enrollments in the future, although many of the students will attend for shorter time periods than was typical in the past.

In fact, implementation of this new mission of vocational education may well lay to rest many of the concerns expressed by vocational educators in reaction to the recommendations of the national reports, especially the notion that requiring more academics and having higher expectations of students will drastically reduce opportunities for students to enroll in vocational programs. Instead, this new view of vocational education is compatible with many report recommendations and enlarges the scope of vocational education by providing an important opportunity for significant expansion of programs. However, this mission will require substantial change in how vocational education has traditionally been delivered.

Finding a New Direction

Difficult choices confront vocational education today. The vocational education systems currently in place were organized in response to the needs of an industrial society. However, the economic, social, and technological requirements of an information/services society are so dramatically different from those of industrial society that it will be very difficult simply to modify present programs. Those vocational education systems that attempt to update, modify, and expand existing programs may find themselves at a dead end by 1990.

Those institutions that travel down the road of major reconstruction of vocational education systems will flourish, because their programs will be helping the United States function successfully in an increasingly competitive global economy. These programs will be responsive to the changing needs of students and of employers. This new direction will require modifications in the roles of the various institutions of vocational education, including—

- a decrease in emphasis on specialized training, which has been the cornerstone of vocational education, and a move toward a balanced program that develops broad, transferable skills as well as job specific skills;
- a shift from large expenditures on specialized equipment to expenditures for staff development and for equipment that helps students develop conceptual understandings with broad applications;
- a change in program emphasis from trade and industrial areas to information and service related occupations;
- new linkages with business and industry;
- a major education program directed at the general public to promote awareness of vocational education opportunities; and

- a closer relationship with general (academic) education in order to ensure a coordinated curriculum across all subject areas.

This new direction for vocational education programs provides tremendous opportunities for expansion of vocational education at the secondary level. The next two sections of this paper describe how New York State has responded to this challenge by beginning the reorganization of its vocational education system.

One Approach to Finishing the Agenda for Excellence in Vocational Education

Recognizing the need to address the major technological, demographic, economic, and social changes taking place in our society, the New York State Education Department began in 1981 to address the task of anticipating future needs of students. Initially, the focus was on establishing new directions for occupational education in New York State.* A 3-year change process known as the Futuring Project began. The basic premise of the Futuring Project was that education exists in a larger context and when that context undergoes change, education too must change if it is to continue to be relevant.

Process for Addressing Change

The review of occupational and practical arts programs began with a series of regional meetings in which 1,200 participants from throughout New York State met with representatives of the State Education Department to discuss various trends both in business/industry and in education that needed to be considered in planning the future direction of occupational and practical arts programs. Based on these meetings, the "Plan for Futuring of Occupational and Practical Arts Education" was developed. This plan called for establishment of an Occupational Education Futuring Committee for each of the eight major instructional programs: agriculture, business, industrial arts, home economics, health occupations, marketing, trade and industrial, and technical education. These committees defined the purpose and objectives of their respective instructional areas, identified competencies and programs, and made decisions and recommendations directly related to their areas. In addition, an Administrative Committee was established to make recommendations on all broad issues relating to more than one instructional area.

Each Instructional Futuring Committee consisted of 20 members: five to seven representatives from business and industry; two to four directors of occupational education and other administrators; four or five teachers; and one member each representing guidance, social studies, 2-year colleges, and students. The chairperson of each committee was from business/industry; the vice-chairperson was an educator. Both also served as liaisons to the Administrative Committee. Thirteen leading classroom teachers, one from each planning region, were also appointed in each of the eight instructional program areas to serve as liaisons between the committees and teachers throughout the State. These individuals, called "regional facilitators," served in an advisory capacity to the Futuring Committees and communicated by way of meetings and regional newsletters with the teachers in their areas.

*New York State refers to vocational education as occupational education and uses the term to include the skills related to job-specific programs as well as the broad, transferable skills identified throughout this paper as a critical component of vocational or occupational programs.

The first 3-day Futuring meeting was held in May 1981; the 10th and final one took place in June 1983.

Futuring Committee Recommendations

Of primary concern to the Futuring Committees was the development of a system that would meet the needs of all students, not just young students but also the ever-increasing number of adults who do not have the skills needed for the emerging occupations and who require retraining in order to maintain or regain employment. Students with handicapping conditions were also recognized as an important population to be served in occupational education. The committees noted that the recent attempts to "fix" the system and make it more responsive to the needs of handicapped and adult students had been ineffective. In restructuring the occupational education system, the ability to serve all of the state's students was recognized as a critical component.

The Futuring Committees wanted a system that would meet the needs of business and industry. Therefore, it was agreed that the identification of skills and competencies needed in the future would be the primary responsibility of business and industry through their leaders on the committees as well as through other contacts with various research projects. The educators' primary responsibility would be to identify the most efficient and effective ways to deliver those skills and competencies. To create a system that would be capable of adapting to the changing demands of business/industry, the committees determined that curricula should be packaged in small units, called "modules," which could be easily rewritten or replaced as the skills needed in the workplace changed. These modules would also include suggested modifications of instructional strategies in order to accommodate students with special needs.

The Futuring Committees identified a group of core competencies that graduates of every instructional program in occupational and practical arts education should possess. This core includes broad skills in the categories of personal development, social systems, information systems, resource management, and technology. (See Appendix A for a complete list of the core competencies identified.)

The Futuring Committees also recommended that the instructional programs in occupational and practical arts education currently outlined in the state curricula, namely agriculture, business, health occupations, home economics, industrial arts, marketing, technical education, and trade and industrial occupations, should be integrated into a coordinated program of instruction for students. This new program would connect repetitive elements being offered in discrete units in each instructional area, yet maintain the unique elements of all instructional areas. Such a revision would allow students to acquire broad, transferable skills and to make decisions about specialized occupations at an appropriate time. In order to accomplish these goals, the committees recommended that the occupational education system be flexible enough to permit students to enter programs when ready, change career directions with a minimum of disruption, and advance to higher skill levels without duplicating previous materials or leaving gaps in knowledge.

Given an occupational education system with the characteristics described above, the Occupational Education Futuring Committees went on to make the following major recommendations:

- The identification of the skills and knowledge to be included in occupational education programs should be uniform throughout the state. Therefore, the state should establish minimum skills and competencies that must be included in all occupational education

programs while local districts should have the flexibility to determine the most efficient and effective way to deliver that instruction.

- A comprehensive accountability system should be developed in order to ensure that minimum program standards are met.

- Curriculum should be developed in small units, or modules, which can be updated or replaced easily to meet changing needs of the business community. Such a modular approach should give local school districts considerable flexibility in providing instruction.

- Increased inservice training should be provided to education professionals to enable them to carry out their roles in implementing the revised occupational education programs.

- Education Law and Commissioner's Regulations should be modified, where appropriate, to enable the education system to meet the needs of adults.

The Regents Action Plan

As the Futuring Committees' deliberations proceeded, the New York State Education Department became increasingly aware that the major technological, demographic, economic, and social changes occurring in the United States would create challenges for the entire education system. In the spring of 1982, the Commissioner of Education and the Board of Regents initiated a comprehensive review of the goals of elementary and secondary education in New York State. Following this yearlong review, the "Regents Proposed Action Plan for Improving Elementary and Secondary Education Results in New York State" was approved by the Regents for discussion at the 1983 Regents/Commissioner's Regional Conferences. The recommendations made by the Occupational Education Futuring Committees had to be included in the proposed plan. This required occupational education to move quickly from a philosophical base, established through the Futuring Project, to a very practical plan for implementation, including specific course requirements and testing programs for occupational education students in New York State. In March 1984, after considerable deliberations and discussions with educators and business leaders throughout the state, the New York State Board of Regents (1984) approved the *Action Plan to Improve Elementary and Secondary Education Results in New York*. The new directions for occupational education were integrated into the plan. The Regents Action Plan set new standards and expectations for education in New York State. The reform proposals in the plan affect every aspect of education, calling for more rigorous high school graduation requirements and a strengthened curriculum starting in the elementary grades.

New Diploma Requirements

New York State issues two kinds of diplomas: a Regents diploma and a local diploma. Beginning with the graduating class of 1989, candidates for both diplomas must acquire 18 1/2 units of credit. Included in the 18 1/2 units must be 4 units in social studies, 4 units in English, 2 units in mathematics, 2 units in science, 1 unit in art and/or music, and 1/2 unit in health education. Not included in the 18 1/2 units of credit but required of all students are 2 units of physical education. Candidates for the Regents diploma must also have three units of credit in a second language.

In addition, each diploma candidate must complete one of the following: two 3-unit sequences or one 5-unit sequence from among the instructional areas of occupational education, mathematics, science, second language, art and/or music; or one 3-unit sequence in the above disciplines and one 5-unit sequence in either English or social studies.

Major Program Directions for Occupational Education

The new program directions for occupational education as defined in the Regents Action Plan are primarily for students in grades 7 through 12. However, two specific core skills will be part of the new elementary school curriculum approved by the Board of Regents in the Action Plan. They include keyboarding, to be taught as part of the elementary language arts curriculum, and computer literacy, to be taught as part of all elementary school curricula, where appropriate, with special emphasis in mathematics. An assessment of the elementary school curriculum, conducted during the spring of 1984, helped determine which other core competencies identified by the Futuring Committees and not addressed in the elementary school curriculum should be incorporated into the occupational education programs for students in grades 7 through 12.

An overview of the major program directions for occupational education, based on the Action Plan and the Futuring Project recommendations, follows. The programs are described in greater detail in the next section of the paper.

Grades 7 and 8 Program

Once students have acquired the foundation skills as part of their elementary school program, they will be provided opportunities for developing basic life skills, career awareness, and job readiness skills through a three-quarter unit requirement in Home and Career Skills, which all students must complete by the end of eighth grade. This requirement takes effect with those students entering grade 7 in September 1986.

Home and Career Skills is designed to prepare the student to meet adult responsibilities as a member of a family, a consumer, a home manager, and a wage earner. Since youth begin to assume these responsibilities early in adolescence, the program is offered at the beginning of the secondary school experience. Using hands-on, or applied, learning experiences, students develop decision-making, management, and personal skills leading to competence in such areas as family resource management, personal development, and career planning.

Competencies developed in a variety of subjects, including language arts, social studies, mathematics, and science, serve as a foundation for the Home and Career Skills program. Considerable coordination with specialists in these subject areas in the development of state syllabi was therefore essential, as it will be in the local delivery of instruction. The Home and Career Skills curriculum was also developed in close cooperation with guidance programs. Home economics instructors have been identified as the primary instructors of the course.

Beginning with the students entering the seventh grade in September 1986, all students will also be required to complete a minimum of one unit of study (instruction for 180 minutes per week for one school year) in Introduction to Technology by the completion of grade 8. This program shifts the emphasis of the traditional industrial arts curriculum from learning to use tools and make products from woods, plastics, and metals to understanding systems of technology in the

home and workplace. Instruction in Introduction to Technology will continue to incorporate hands-on experiences in shops and laboratories; however, the emphasis will be on using and maintaining technological devices rather than building crafts. Systems of technology in fields such as production, transportation, construction, communications, and agriculture are emphasized. Consideration of the economics of technology, intended and unintended effects, and outcomes of technology helps students understand how technology affects people and the environment in a broad sense and the role that government and society should assume in maintaining control. Industrial arts teachers have been identified as the primary instructors in the technology program.

Grades 9 and 10 Program

Beginning with the class of 1992, all students following an occupational education sequence must successfully complete a minimum of one unit, and in some sequences two units, in Introduction to Occupations. This instruction will typically occur in grades 9 and 10. The course content and competencies focus on occupational awareness, job readiness, and occupational preparation for broad career options. These skills and knowledges can be offered in a stand-alone course in Introduction to Occupations or may be integrated into specialized occupational courses. The course is designed as a transition from Home and Career Skills and Introduction to Technology, which all students will have taken in grades 7 and 8, to the specialized courses offered in grades 11 and 12.

Included as part of any Introduction to Occupations course will be instruction in two required 9-week modules: Personal Resource Management and Working Citizen. To meet the remainder of the 36-week minimum requirement for Introduction to Occupations, each district will select from a series of optional modules. These modules have been developed around, and relate to, the business, health, service, trade, technical, technology, and agriculture programs. Certain important competencies, known as process skills, have been integrated as appropriate into the modules' performance objectives and instructional strategies: human relations/leadership, safety/work habits, mathematics/science, career options, use of technology, decision making/problem solving, and communications.

Occupationally Related Courses for General Education Credit

A series of occupationally related courses has been identified that may be used for general education credit. As part of the new diploma requirements in the Action Plan, all students must complete two units in mathematics and two units in science at the high school level, beginning with the class of 1988. State guidelines have been developed to permit occupationally related mathematics and science courses to fulfill the second unit requirements for students who are candidates for a local diploma and in some cases a Regents diploma.

State syllabi for occupationally related mathematics and science courses have been developed by State Education Department curriculum teams. The teams have identified content for application both as freestanding courses and as integral parts of occupational program modules. The curricula for the occupationally related mathematics and science courses afford maximum flexibility to districts. Modules have been outlined so that they may be selected and sequenced to satisfy the needs and interests of individual students or classes as well as to prepare students for the career opportunities unique to an employment area.

The New York State Board of Regents has approved the use of a series of other occupational education courses to fulfill general education graduation requirements. Among those courses is the business communications course, which is a core course within the business education program and may be used to fulfill the fourth unit of English credit. Mechanical drawing, part of the technology program and in some cases the trade program, may be used to fulfill the one unit of art requirement that is needed for graduation. Other courses in occupational education that may be used for general education credit include business law, to fulfill a unit of the social studies requirement; fashion design, which may be used to fulfill the art requirement; the technology education technical writing course, which may be used to fulfill a unit of the English requirement; and the health occupations education core, which may be used to fulfill the health requirement for graduation.

Grades 11 and 12 Program

In grades 11 and 12, the occupational education program permits students to concentrate on one or more occupational clusters and to develop entry-level job skills. Instruction in each specialized area begins with a core course of one or two units. The number of additional courses (units) that students are required to take for a sequence in a particular specialization area varies from three to six.

Schools offering occupational preparation programs will be permitted considerable latitude in the organization and scheduling of the modules to be covered, usually over a 2-year period. Some schools may organize modules to permit postponement of specific occupational preparation until grade 12, while others will begin such programs in grade 10. Examples of scheduling options are provided in the next section of the paper and in the Appendices.

A statewide vocational education testing program, based on the state syllabi, will be put in place. Vocational education students must pass the appropriate exams in order to graduate.

Detailed Description of New Program Directions for Vocational Education in New York State

Foundations Built in Grades K-6

Viewing the education system as a continuum, the Futuring Committee identified core competencies that occupational education students need to possess in order to move on to more advanced learning. (See Appendix A for a complete list.) In order to identify if and when the core competencies were being taught, the State Education Department developed an assessment tool and surveyed elementary, secondary, and postsecondary teachers and administrators across the state. In addition, more than 400 representatives from both education and business and industry participated in the 1982 Regents/Commissioner's Regional Conferences and provided information that helped to identify the basic skills needed by students in the next decade. Subsequent to both the Futuring Committees' and the Regents' review, the state syllabi were revised to include the newly identified foundation skills in elementary education. Core competencies not being taught in the elementary curriculum were included in the state syllabi developed primarily for grades 7 and 8, eliminating any existing gaps and overlaps in the continuum.

In recognition of the advancement into a technological society and the widespread use of computers, keyboarding and computer literacy were identified as important basic skills to be included in the elementary curriculum. As computers continue to become more prevalent in homes, classrooms, and workplaces, students need to be familiar with fundamental keyboarding techniques and become computer literate. Computer literacy means a knowledge of keyboarding functions in order to record, retrieve, and manipulate data as well as use the keyboard for communication.

The 1984 New York State Board of Regents *Action Plan to Improve Elementary and Secondary Education Results in New York* states that instruction in keyboarding should be included in the state-developed English language arts syllabus. One of the most promising aspects of the use of electronic keyboards and computers in schools is their potential impact on language arts programs. Keyboarding and computer literacy are important enabling skills for developing competence in—

- keying in responses to interactive educational drill and practice coursework;
- accessing information from a data base;
- participating in computerized learning games and simulations;
- organizing and analyzing data; and
- recording ideas and drafting, revising, and editing writing.

Keyboarding/computer literacy instruction is designed to be integrated into the elementary language arts program as an enabling skill for manipulating data and ideas, thus allowing students to discover, record, arrange, and communicate information in ways never before possible. Students will receive this instruction at the grade level in which they are first expected to use electronic keyboards in learning situations requiring efficient input, retrieval, and manipulation of words, symbols, and data. Additional guidelines for providing efficient and effective keyboarding/computer literacy instructions are as follows:

- Because of the large number of symbols and command functions available on electronic keyboards, instruction should focus on correct fingering techniques from home-row locations.
- Sequential and cumulative introduction of new keys with opportunities for practice and application is essential for students to learn effective keyboarding fundamentals.
- Brief, frequent, scheduled instruction is more beneficial than lengthy, sporadic, and random practice sessions.
- Keyboards (electric typewriters or computers) should be readily available for students to use independently for practice and application of new skills they learn during instructional time.
- Furniture and equipment should be adjustable to accommodate a range of pupil sizes so that students may comfortably attain proper body position and posture for effective operation of keyboards.
- Instructional materials such as texts, charts, and software should be appropriate for the developmental level of pupils for whom they are intended and for the objectives of the program.
- In order for pupil learning to be most effective, elementary classroom teachers must have adequate training in the instructional goals, objectives, and methodology of keyboarding instruction.
- Teachers responsible for providing keyboarding instruction should be familiar with the strengths and limitations of instructional support materials and their appropriate use in elementary keyboarding instruction.
- Business education teachers should be called upon to assist in the development of keyboarding curricula, inservice training, and selection of materials and methodology.

Programs in Grades 7 and 8

Two new courses, Home and Career Skills and Introduction to Technology, are being developed and implemented as a result of the adoption of the Regents Action Plan and the new Part 100 of the Commissioner's Regulations that relates to elementary and secondary education. The Regulations require that by the end of grade 8, all students will have completed instruction in these courses. Both courses build on the foundation skills attained in elementary school.

The overall objectives and competencies that have been established for these courses are based on the recommendations of the Occupational Education Futuring Committees. Teams of teachers, teacher educators, guidance personnel, and representatives from business completed the draft curricula in May 1984. Reviewers from the relevant instructional areas, both in-state and out-of-state, made suggestions that were incorporated into the revised curricula that were informally field tested in the 1984-85 school year throughout New York State. During that school year, more than 1,000 teachers and 50,000 students in 600 schools were involved in development and initial field testing of the draft Home and Career Skills and Introduction to Technology curricula. In 1985-86, more than 2,000 teachers and 80,000 students in 1,000 school buildings participated in the continued development of these courses.

The curricula have been organized in modules of instruction, as recommended by the Futuring Committees, to accommodate local flexibility in delivering programs. The modular format for these courses, as well as all other occupational education curricula, enables schools to make optimum use of their staffs and facilities. For example, in Introduction to Technology and Home and Career Skills, the modular format enables schools to offer the curriculum in grades 6, 7, and 8, or in grades 7 and 8, or in just grade 7 or grade 8.

Home and Career Skills

Home and Career Skills is designed to prepare adolescents to meet their present and future responsibilities as family members, consumers, home managers, and wage earners. Students learn how to make sound decisions, solve problems, manage resources, and benefit from experience. The broad objectives of the Home and Career Skills program are for students to—

- develop skills that lead to effective decision making, problem solving, and management in the home, school, community, and workplace;
- develop concepts and skills basic to home and family responsibilities; and
- develop personal skills which will enhance employment potential.

The curriculum is organized into four highly interrelated and interdependent modules: Process Skills, Personal Development, Personal and Family Resource Management, and Career Planning.

The Process Skills module introduces decision-making, problem-solving, and management skills, which are applicable to all areas of daily living. These skills are then applied throughout the other modules. In Personal Development, students apply decision-making skills to their individual lives and their relationships with others. In Personal and Family Resource Management, students apply their decision-making and management skills to the resources in the world around them, including what they buy, what they eat, how they dress, and where they live. The Career Planning module gives students the opportunity to begin making decisions and solving problems related to tentative career directions.

The Home and Career Skills course is taught by using a hands-on, experiential approach to learning so that principles and knowledge are applied in a planned, sequential manner in every module. The use of real-life tasks such as purchasing clothes, planning meals, and keeping within a budget, of simulations such as role playing, and of community involvement activities is an integral part of the course, as are library research, class discussions, and group activities. The student

is expected to be actively involved in learning and to have the opportunity to practice and develop skills related to the course content. Through the practical, hands-on, coordinated approach of Home and Career Skills, students will develop a better understanding of their responsibilities for making choices, for taking action, and for dealing with the consequences of those actions.

Introduction to Technology

Introduction to Technology is designed to enable students to understand the concepts that underlie technological systems. Students learn about the influence that technological systems have on their lives, at home, at school, and in the world of work. The systems studied are Biotechnology (agriculture, medicine, food processing and preservation), Information/Communications Technology (information processing, photography, graphic and electronic communications), and Physical Technology (construction, energy, manufacturing, transportation). A major emphasis is on providing students with opportunities to apply their new understanding of technology to the solution of problems and to the design, development, maintenance, and operation of systems in each of the three categories.

The curriculum for Introduction to Technology is organized into two parts. The modules in Part I are Getting to Know Technology, What Resources are Needed for Technology, How People Use Technology to Solve Problems, What Must Be Known About Systems and Subsystems, and How Technology Affects People and the Environment. Through a study of such resources as materials, tools and machines, information, capital, human labor, time, and energy and an exploration of how these resources are combined in technological systems, students are provided with some conceptual tools that can be useful in solving technological problems. Examples of tasks that students might undertake are to—

- construct a wind chime that illustrates the sound produced by certain materials;
- manufacture glass from raw materials;
- optimize plant growth by changing the levels of light, moisture, and nutrients in a functioning greenhouse; and
- design a device that will make a task easier for a person with a physical handicap.

Part II of the Introduction to Technology curriculum addresses additional technological concepts, focusing on technical processes, the methods that people can use to control them, career opportunities related to technology, and other personal and societal implications of technology. Students encounter a wide variety of technical processes such as energy conversion, materials conversion, and information processing, monitor these processes, and use feedback to control the operations of systems. The module titles in Part II are Introduction and Review, Choosing the Right Resources, How Resources are Processed by Technological Systems, Controlling Technological Systems, Using Systems to Solve Problems, and Technology and You: Personal Impacts, Decisions, and Choices. Examples of technical processes students might learn about include—

- the conversion of mechanical energy to electrical energy;
- the making of plastic through vacuum forming; and

- the use of computers to produce graphics and to communicate data over telephone lines.

The Introduction to Technology curriculum includes Technology Learning Activities (TLAs), which are suggested instructional activities that teachers can use to meet specific performance objectives in the course. The activities emphasize hands-on learning experiences. Whenever applicable, the use of computers is encouraged and supported in the curriculum. In addition, the following skills and concepts have been identified as important to address in every module where appropriate: mathematics concepts (applied), science concepts (applied), awareness of human elements and societal impacts of technology, communication skills, safety, psychomotor skills, and career-related information.

Observations on Initial Implementation of the New Curricula

The new curricula for Home and Career Skills and Introduction to Technology were field tested in many schools throughout the state. Some of the observations and outcomes of that process include the following:

- Teachers were initially concerned about the changes in the curriculum, but as they became more familiar with the new modules, they began to develop creative strategies to meet the needs of their students, and their enthusiasm for the programs increased significantly.

- The networking created by the teams involved with Home and Career Skills has resulted in administrators, guidance personnel, teacher educators, and teachers working together, communicating with their peers, and cooperatively recommending changes. Team members and trainers for both courses have participated on their own in many superintendent's days and meetings called by local administrators.

- Professional organizations are giving positive support by planning meetings and conferences to help keep teachers and others up to date.

- Administrators have generally moved forward to implement programs before the deadline date.

- Many school districts not involved in the informal field testing requested materials and permission to be involved in the inservice meetings conducted in the spring and summer of 1985.

- Extraordinary interest in these two courses has arisen in other states. Many out-of-state requests for draft copies of materials and information regarding the inservice process used have been received. Representatives from several states have visited New York to review the pilot programs and participate in the inservice programs.

- Representatives from publishing companies and suppliers are spending considerable time talking with teachers and leaders to assure that adequate resources are provided for implementation.

- Teacher educators are considering changes that need to be made in preservice and graduate programs to prepare teachers for implementing the new courses.

Programs in Grades 9 and 10

Introduction to Occupations

Introduction to Occupations was conceived as a transitional program for students who have completed the required courses in Home and Career Skills and Introduction to Technology and are preparing to enter the specialized occupational education programs in grades 11 and 12. This integral part of the continuum of occupational education has been designed to include instruction in all areas of occupational education. Although it may be offered at any secondary grade level, it is recommended for grades 9 and 10.

The two major purposes of the Introduction to Occupations course are for the student to develop transferable skills that can be used in later work or home responsibilities and to investigate occupational interests and abilities prior to taking more specialized occupational courses. Introduction to Occupations allows students to have exploratory experiences in several occupational areas before committing themselves to a specific occupational sequence, thus avoiding the problem of making early career decisions that cannot be reversed.

The curriculum in Introduction to Occupations helps students develop fundamental concepts and skills in preparation for further occupational programs. The curriculum includes many core competencies that all occupational education students should obtain as part of an education program. It also includes "process skills"—important competencies such as applied math and science, interpersonal relations, safety in the workplace, and career planning—which can best be taught in connection with specific technical content. Process skills are integrated into the modules where appropriate. (See Appendix B for descriptions of the process skills contained in the Introduction to Occupations modules.)

Introduction to Occupations is organized into modules recommended to be taught in 9 weeks or a minimum of 27 hours. These modules may be combined by local districts to provide a variety of student options. Certain modules are required or recommended for the completion of specific occupational sequences. Units earned in Introduction to Occupations are added to units earned in specialized modules to meet a sequence requirement. For students graduating in 1989 and thereafter, each approved occupational education sequence must include a minimum of one unit of credit in Introduction to Occupations.

The content of two modules, Working Citizen and Personal Resource Management, is required for all students completing an occupational sequence. These modules present key skills and competencies that students must acquire regardless of their choice of occupational direction.

The purpose of Working Citizen is to introduce students to the realities of the working world. Each topic focuses upon a specific area of information and personal development that helps the individual integrate his/her role within the workplace and the home. The premise on which this module was developed is that a person's career or occupation often plays a leading role in his/her life. Working Citizen is designed to provide students with information and experiences that will help them make future choices concerning work.

Among the skills, knowledge, and behaviors to be developed in this module are the ability to—

- apply and relate the influence of economic concepts to the job market and to individual standards of living;

- explain the benefits of regular employment and the effect of a substantial lack of employment on a community;
- assess personal skills and talents and relate them to employment preferences;
- develop personal goals for education, training, and future employment;
- identify personal characteristics and qualities that are desirable for successful employment;
- describe and use resources for employment information; and
- determine the relationship of education and training to acquisition and maintenance of employment.

Personal Resource Management deals with interrelationships among resources and needs, wants, goals, and life-styles and with the managerial aspects of assessing, enriching, and using personal and financial resources to ensure responsible, participatory, and fulfilled personal and work lives. The student is guided by basic knowledge of the nature and organization of available and potential resources while acquiring specific knowledge in areas that need management by all workers. Management and decision-making skills are used to solve appropriate problems. The development of coping and critical thinking skills is another focus of Personal Resource Management.

Some of the skills, knowledge, and behaviors to be developed in this module are the ability to—

- identify personal and financial resources;
- relate resources to needs, wants, goals, and personal and career fulfillment;
- manage, enrich, and conserve personal and financial resources;
- apply resource management skills to consumerism; and
- develop financial responsibility.

Schools must make available optional modules in addition to the two required modules in order for students to be able to initiate an occupational sequence. Schools are encouraged to offer modules that reflect a variety of occupations and to avoid structuring student programs that provide only a narrow selection of modules leading to a single concentration area. A few students who have made a clear career choice may benefit from a narrow selection of modules; however, most students should be encouraged to take modules from diverse occupational areas.

Students may take optional modules in any order, and there is no requirement for all students pursuing occupational education to complete identical content in Introduction to Occupations. Students may take more than one unit (four modules) of Introduction to Occupations; however, the number of modules that is credited toward an occupational sequence will be determined by the requirements of that sequence. To meet the minimum requirements for completing an occupational sequence, each student must (1) acquire the competencies in the two required modules and (2) acquire the competencies in two optional modules.

It is recommended that the occupational education available in grades 9 and 10 be in Introduction to Occupations modules. A complete list of the Introduction to Occupations modules appears in Appendix C. Examples of scheduling options for the modules can be found in Appendix D.

Occupationally Related Courses for General Education Credit

As stated previously, the New York State Regents Action Plan requires all students to complete two units in mathematics and two units in science beginning with the class of 1988. Effective September 1, 1985, the Commissioner's Regulations have been modified to allow students pursuing an approved sequence in occupational education to use occupational courses to meet diploma requirements in general education.

For a local diploma, Commissioner's Regulations specifically authorize the use of a state-developed occupationally related science and/or occupationally related mathematics course or business mathematics to satisfy one of the two required units in science and/or mathematics for students pursuing an occupational education sequence. Occupationally related mathematics is a second-year mathematics course that provides instruction in mathematical procedures for problem solving, decision making, and day-to-day operations related to the various occupational areas. The state syllabus contains examples of how the several areas of mathematics are applied to a variety of employment tasks. The business mathematics course is designed to serve as a background for subsequent business courses, to further vocational preparation for a business position, and to meet the personal and consumer needs of students. Topics include mathematics related to personal financial management, business operations, office applications, and banking. Occupationally related science is a second-year science course in which the principles of several sciences are presented in the context of practical applications within the world of work.

The use of the occupationally related mathematics and science courses to fulfill unit requirements for occupational education students pursuing a local diploma is recommended. For students enrolled in an occupational sequence leading to a Regents diploma, only Regents mathematics courses can fulfill the mathematics requirements.

Programs in Grades 11-12

Although numerous options exist for the organization of the new occupational curriculum, schools will typically begin their program with one unit in Introduction to Occupations for all occupational education students. This course would be followed by one- to two-unit core courses for each occupational education instructional area (home economics, business, agriculture, etc.) and conclude with one to nine units of specialized training, depending upon the program. Organized in this manner, the curriculum allows the students to postpone selecting a narrow area of specialization as long as possible, a timetable that is in line with recommendations of several national reports.

After completing the course in Introduction to Occupations, students interested in the building trades, for example, would be offered modules that introduce them to skills applicable to several trades, as part of the grade 11 program. Students would then develop specific trade skills

(plumbing, masonry, and carpentry) in the second year of this concentration phase. Business education majors might be scheduled during the 11th year for modules of instruction in business organization and management, business communication, keyboarding, and other general job skills, postponing the specialization skills essential to general office, bookkeeping, or marketing positions until the 12th year.

In either of the illustrations cited, however, schools may prefer to combine instruction in both the broad and specialized job skills over the 2-year period devoted to occupational preparation, and provide opportunities for students to change areas of specialization as the result of tryout experiences.

All occupational education students must follow a state-approved sequence in occupational education leading to some specific skill development. The sequences are designed to permit flexibility for students in keeping their options open and to provide broad, transferable skills necessary for a cluster of occupations. A key aspect in the delivery of the new programs will be more interdisciplinary programming than in the traditional occupational education programs.

Beginning with the graduating class of 1989, all occupational education sequences for a local or Regents diploma must be state approved and the unit (time) requirement of the sequences must be met. The class of 1990 will have to meet the new content requirements, and the class of 1991 must take and pass state occupational education proficiency examinations, where available.

Appendix E provides a summary of all the new occupational education sequences in chart form. The chart presents the conceptual framework used to plan the new occupational education program. New sequences for agriculture, business/marketing, health occupations, home economics, technical, technology/industrial arts, and trade and industrial education are in the process of being developed. The new sequences are designed to ensure that all occupational education students develop broad, transferable employment skills as well as job-specific skills. They are also designed to provide local schools the opportunity to organize their specific course offerings in a variety of ways.

To illustrate how specific modules/courses in an occupational education sequence are now being organized, the new business/marketing sequences are outlined in Appendix F as an example.

State Standards and Accountability

The Futuring Project recommendations and the Regents Action Plan both call for state standards in vocational education. Standard setting has been initiated through the development of state syllabi for all vocational education programs. These syllabi begin with a series of modules that are then built into courses. Courses are combined to meet the requirements of various vocational education programs.

Approximately 140 curriculum teams have spent the past 2 years writing all of the various modules in courses that comprise the vocational education programs in the state. These curriculum teams are comprised of classroom teachers, department chairpersons, teacher educators, representatives of business and industry, and special education specialists. The teams are responsible for developing syllabi based upon the conceptual directions established for each program by the Futuring Committees. Each syllabus follows a prescribed state format including performance and enabling objectives as well as instructional strategies.

These syllabi, which establish the minimum state standards for each program, have been used as a basis for the development of a statewide vocational education testing program. By the action of the Board of Regents, all vocational education students must pass the state vocational education examinations where available prior to graduating from high school. In most cases, students will be required to take two state exams, one that deals with the two required modules in Introduction to Occupations and a second that deals with the specialized program area. The specialized exam will include a secure written exam plus a series of performance activities or laboratory experiences students will have to complete prior to, or as part of, their state exams.

The results of the state vocational education exams will then be submitted to the State Education Department and reviewed on a school by school basis. Through a Comprehensive Assessment Report, the results will be returned to school superintendents and boards of education so that they may compare the performance of their students with others both in their region and statewide. The information in the Comprehensive Assessment Report must be made available to the public annually.

Updating of Staff and Facilities

The implementation of these new programs and accountability systems requires a substantial retraining of the professional staff in vocational education. Virtually every vocational education teacher will need to go through a major retraining program in order to deliver the new skills and competencies called for in the state curricula. To make the new modules more accessible, a substantial effort has been made in all curriculum development activities to create numerous instructional strategies, including "hands-on" or applied learnings, that can be used by teachers as they begin to implement the new programs. The State Education Department has begun the process of retraining teachers by establishing a cadre of trainers who receive substantial training and experience at the state level and who in turn are available to provide updating of their colleagues on a regional basis. Several million dollars will be spent in this area over the next few years.

A major modification in the preservice teacher education programs is also essential. Work has begun with teacher education institutions to assist them in revamping their programs. This revamping will be spearheaded by changes in the state certification requirements. Teachers from several instructional areas will be qualified to teach many of the new courses that deliver the broad, transferable skills that are an essential part of the new vocational education program. Therefore, appropriate modifications in certification are necessary to assure clear and concise decisions concerning tenure issues.

The Department is in the process of developing facilities and equipment guides for local schools and area occupational centers to assist them in the retooling of their physical facilities.

Summary

The new program directions for occupational education in New York State are primarily for students in grades 7 through 12. However, two core skills will be offered as part of the continuum in the elementary school: keyboarding and computer literacy. The seventh- and eighth-grade programs in Introduction to Technology (1 unit) and Home and Career Skills (3/4 unit) are mandated for all students and serve as a foundation for every occupational education program. The grades 9-10 program, Introduction to Occupations (1 unit), must be included in all occupational education sequences. It serves as a transition from Introduction to Technology and Home and Career Skills to the specialized program areas. It may be taught as a stand-alone course or integrated into the area of specialization. If integrated, the time requirement of the specialization curriculum must be extended by one unit. All sequences must be state approved.

In grades 9 and 10, modules/courses/sequences are designed to teach broad, transferable skills that may be used in a cluster of occupations, with specific job skills postponed to grades 11-12 to allow flexibility for students in making specific career decisions.

The use of occupationally related courses to fulfill general education requirements is recommended for students pursuing an occupational education sequence.

Items That Must Be Included in a New Agenda for Vocational Education

Vocational education in the United States is at a crossroads. The economic, social, and technological needs of this country throughout the remainder of the 20th century are going to be dramatically different from those that have existed during the past several decades. Decisions made during the next two to three years will determine whether vocational education will be able to continue to meet the needs of the country as it has during the past several decades. The road to success requires a major restructuring of vocational education, to include the following elements:

- A new vision of vocational education as an integrated and interrelated part of the overall education program for all students must be established. This new vision must eliminate the concept that vocational education is separate and distinct from general education. Vocational education must modify its courses and convince policymakers that it should and does include academic content and therefore can be used as a viable alternative for fulfilling general education requirements.

- Vocational education must identify a series of core skills that it delivers to all students within the education system. This needs to be done through very careful development of a coordinated curriculum that builds on traditional home economics and industrial arts programs in junior high schools and continues through the 9-12 traditional vocational education programs, industrial arts, nonvocational home economics, and nonvocational business education. All of these programs must be viewed as one coordinated curriculum rather than as separate and distinct courses.

- The development of a comprehensive inservice program is essential. Educational personnel need to understand the new, balanced program, which includes broad, transferable skills as well as the more traditional job-specific skills, in order for them to be successful at implementation.

- The use of traditional vocational education teaching methods and equipment must continue. "Hands-on" experiences for students are essential. However, tools, materials, and facilities must be seen as means to an end, rather than ends in and of themselves.

- A major public awareness program must be initiated by vocational educators to convince school administrators, guidance counselors, students, business/industry leaders, policymakers, and the general public that vocational education in the future will be a balanced program that develops broad, transferable skills as well as job-specific skills.

- Vocational education must be willing to examine the roles and relationships of the various institutions that are delivering vocational education instruction. The role of regional vocational centers, for example, must be carefully reevaluated to see how they can not only continue to meet the needs of the limited number of students they have served in the past but also be expanded through their specialized staffs and facilities to provide broad, transferable skills to a much wider range of students.

- A major upgrading and expansion of teacher education programs, which have been experiencing dramatic decreases in enrollment, must be undertaken. Efforts must be made to find ways to update teacher education programs so that they are responsive to the dramatic changes that are occurring in secondary and postsecondary vocational education programs.

- An expanded effort must be initiated to increase youth leadership development and cooperative work experience models in vocational education.

The future of vocational education is very bright if vocational educators are willing to face the tremendous challenges involved in a major reconstruction of vocational education systems. Without change, vocational programs will be following the path that leads to the past, with serious consequences for the U.S. economy as it struggles to compete in the global arena. With change, vocational education can assume a leadership role in contributing both to the excellence of schools and to the strength of U.S. society.

Appendix A

Core Competencies

These competencies have been identified as important for every graduate of a vocational education program.

I. PERSONAL DEVELOPMENT

1. Personal Skills
2. Self-concept
3. Personal Appearance
4. Health
5. Use of Leisure Time
6. Adaptability
7. Decision Making
8. Problem Solving
9. Interpersonal Relations
10. Social Skills
11. Participation and Interaction with Groups and Organizations
12. Leadership
13. Career Awareness/Exploration/Information
14. Goal Setting/Career and Education Planning
15. Job Application
16. Job Retention, Including Work Habits
17. Job Progression and Change
18. Employer and Employee Relations

II. SOCIAL SYSTEMS

1. Economic Concepts
2. Political Literacy
3. Legal Literacy

III. INFORMATION SKILLS

1. Verbal Communication
2. Nonverbal Communication
3. Listening
4. Written Communication
5. Reading Comprehension
6. Computation
7. Information Retrieval
8. Dictating Communication Skills
9. Keyboarding Skills
10. Use of Information Systems

IV. RESOURCE MANAGEMENT

1. Money
2. Time
3. Natural Resources
4. Human Resources
5. Consumer Skills

V. TECHNOLOGY

1. Concepts of Technology
2. Developing Technologies
3. Applications of Current and Emerging Technologies
4. Use of Basic Tools and Equipment
5. Work-related Health and Safety
6. Personal Safety

Appendix B

Process Skills

Many competencies that are desired student outcomes can best be taught in connection with specific technical content. Process skills identify the major categories of these types of competencies. The following process skills are integrated as appropriate in each Introduction to Occupations module through performance objectives and instructional strategies.

Human Relations-Leadership Skills

This includes fundamental principles of interpersonal relations and their importance to the individual, both personally and on the job. Topics include demonstration of initiative, capacity for decision making, and management skills leading to resourcefulness and ability to anticipate tasks, to assume responsibility, and to motivate people. Activities of the occupational student leadership organizations are effective techniques to develop human relations and leadership skills.

Safety-Work Habits

This includes factors that contribute to safety in all environments. Topics include awareness of potential hazards in the use of tools, equipment, and material; demonstration of emergency safety procedures; agencies that protect individuals in work environments; demonstration of judgment regarding attire, materials, tools, equipment, and environment in specific activities; and determination of remedies in situations with health/safety deficiencies.

Math/Science

Basic math and science concepts and processes are applied to a variety of occupational situations. This includes demonstration of knowledgeable application of these concepts in occupational settings.

Career Options

Career planning is an ongoing process yielding a comprehensive plan of flexible alternatives to deal with educational needs, occupational needs, and life career needs. Career options include identification of the interrelationship of goals, values clarification, evaluation of interests and abilities, and career investigations.

Use of Technology

This includes applications of current and emerging technologies and the need for planning, managing, and controlling technology. Also included is an awareness of the progression, acceleration, use, impacts, and effects of technology.

Decision Making/Problem Solving

This includes the application of decision-making/problem-solving techniques and processes to work and personal experiences. Students will determine short-term and long-term goals, address immediate needs, and identify strategies for successful resolution.

Communications

This includes understanding the language of nonverbal communication and improving listening skills, voice usage, and writing skills. Also included is a demonstration of the ability to determine the needs of the receiver and to format, choose, and phrase the communication to meet those needs.

Appendix C

Introduction to Occupations Module Directory

Personal Resource Management

Working Citizen

Human Relations/Decision Making

Human Development Careers/Parenting

Introduction to Foods and Human Nutrition

Introduction to the Economics of Work

Basic Communication Skills

Keyboarding

Keyboarding Applications

Information Technology

Visual Communications

Introduction to Keeping Business Records

Introduction to Natural Resources

Basic Systems of Construction

Basic Systems of Manufacturing

Basic Systems of Transportation

Basic Systems of Energy

Basic Systems of Communication

Basic Mechanical Principles and Skills

Basic Mechanical Maintenance and Service Practices

Introduction to Plant Science

Introduction to Animal Science

Basic Electricity/Electronics

Basic Technical Drawing

Introduction to Reading Blueprints and Drawings

Basic Textiles and Design

Appendix D

Models for Implementing Introduction to Occupations

The following examples illustrate some of the ways schools might schedule Introduction to Occupations. These examples relate primarily to ninth-grade offerings.

Generic

All students taking occupational education complete the same course.

Working Citizen Personal Resource Management	Economics of Work Human Relations/Decision Making

Split Semester

All students take common first semester and one of three choices for second semester.

Working Citizen Personal Resource Management	Keyboarding Keyboard Applications
	Construction Systems Manufacturing Systems
	Plant Science Animal Science

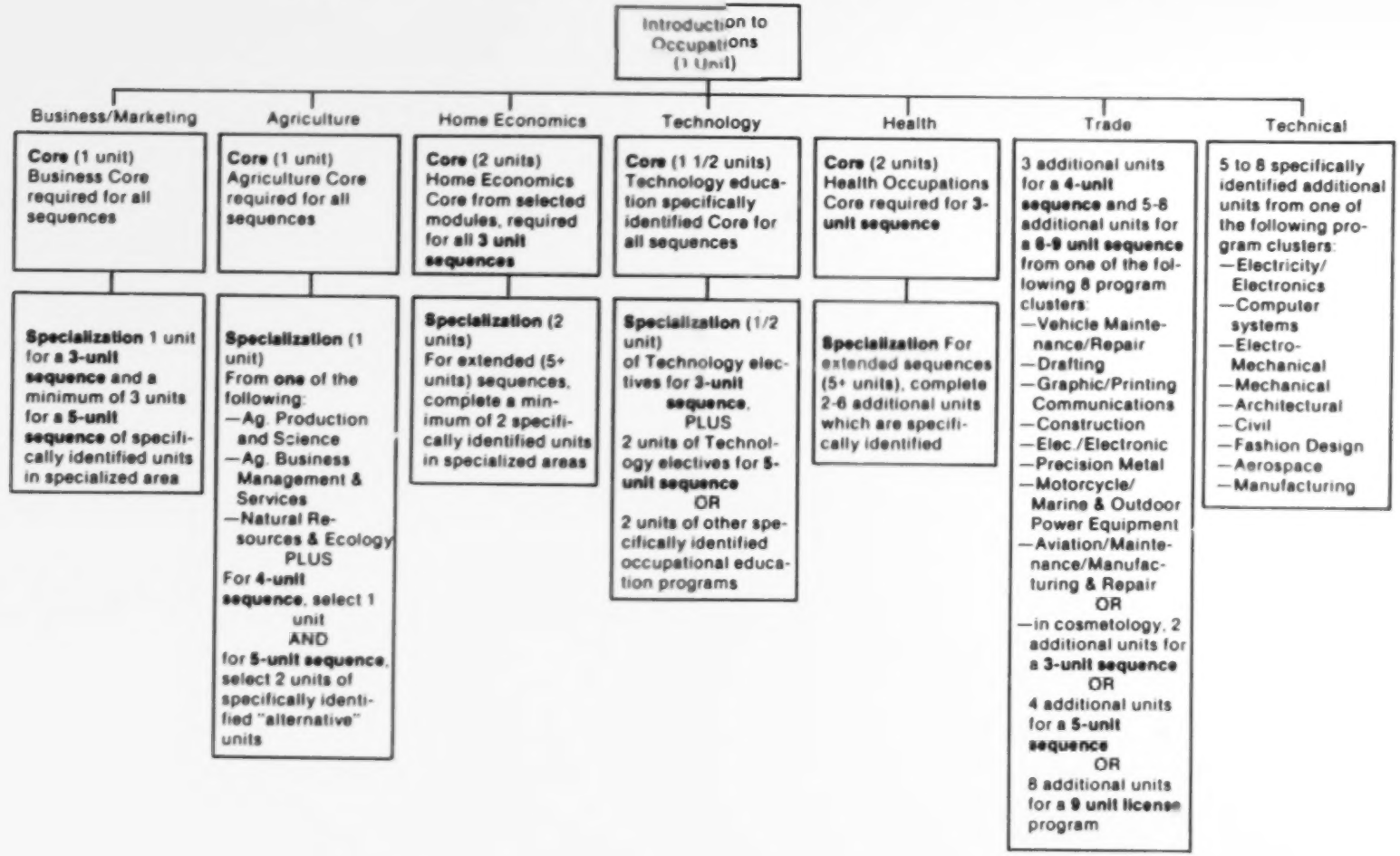
Separate Courses

Three separate courses are developed for students with different interests.

Working Citizen Personal Resource Management	Technical Drawing Electricity/Electronics
Working Citizen Personal Resource Management	Introduction to Foods Human Development
Working Citizen Personal Resource Management	Information Technology Visual Communications

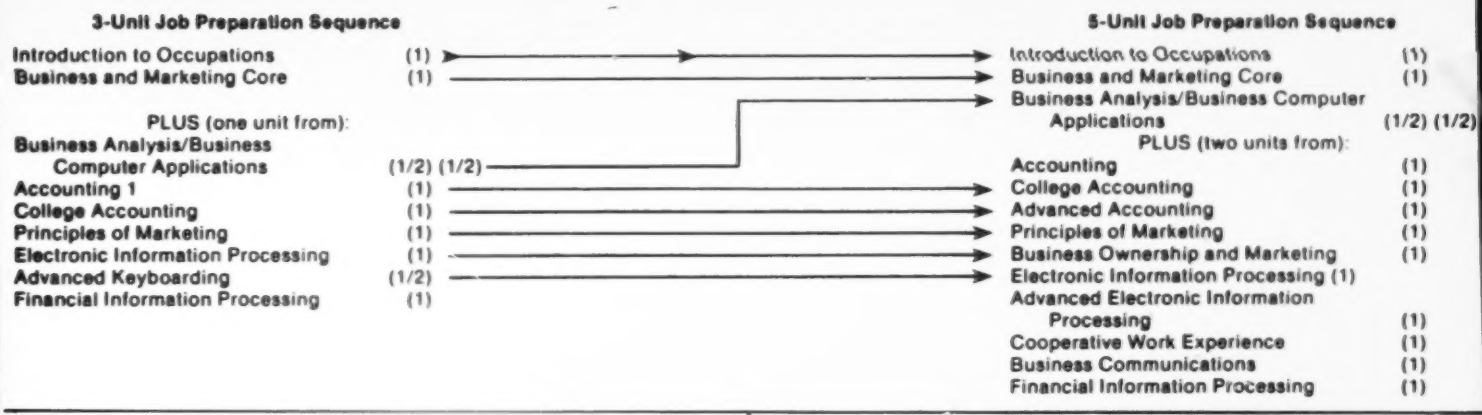
Appendix E

Summary of Occupational Education Sequences
General Conceptual Framework
(see Appendix F for an actual sample sequence in Business/Marketing)


Introduction to Occupations (1 Unit)
Business/Marketing
Core (1 unit) Business Core required for all sequences
Specialization 1 unit for a 3-unit sequence and a minimum of 3 units for a 5-unit sequence of specifically identified units in specialized area
Agriculture
Core (1 unit) Agriculture Core required for all sequences
Specialization (1 unit) From one of the following:
—Ag. Production and Science
—Ag. Business Management & Services
—Natural Resources & Ecology
PLUS
For 4-unit sequence, select 1 unit
AND
for 5-unit sequence, select 2 units of specifically identified "alternative" units
Home Economics
Core (2 units) Home Economics Core from selected modules, required for all 3 unit sequences
Specialization (2 units) For extended (5+ units) sequences, complete a minimum of 2 specifically identified units in specialized areas
Technology
Core (1 1/2 units) Technology education specifically identified Core for all sequences
Specialization (1/2 unit) of Technology electives for 3-unit sequence,
PLUS
2 units of Technology electives for 5-unit sequence
OR
2 units of other specifically identified occupational education programs
Health
Core (2 units) Health Occupations Core required for 3-unit sequence
Specialization For extended sequences (5+ units), complete 2-6 additional units which are specifically identified
Trade
3 additional units for a 4-unit sequence and 5-8 additional units for a 6-9 unit sequence from one of the following 8 program clusters:
—Vehicle Maintenance/Repair
—Drafting
—Graphic/Printing Communications
—Construction
—Elec./Electronic
—Precision Metal
—Motorcycle/ Marine & Outdoor Power Equipment
—Aviation/Maintenance/Manufacturing & Repair
OR
—in cosmetology, 2 additional units for a 3-unit sequence
OR
4 additional units for a 5-unit sequence
OR
8 additional units for a 9 unit license program
Technical
5 to 8 specifically identified additional units from one of the following program clusters:
—Electricity/ Electronics
—Computer systems
—Electro-Mechanical
—Mechanical
—Architectural
—Civil
—Fashion Design
—Aerospace
—Manufacturing

Appendix F
Business/Marketing Education Sequences
for Students Graduating 1990 and Thereafter

NOTE: Students graduating 1991, in addition to meeting unit requirements, must meet the occupational education proficiency testing requirements in business/marketing education.


3-Unit Job Preparation Sequence
Introduction to Occupations (1)
Business and Marketing Core (1)
PLUS (one unit from):
Business Analysis/Business Computer Applications (1/2) (1/2)
Accounting 1 (1)
College Accounting (1)
Principles of Marketing (1)
Electronic Information Processing (1)
Advanced Keyboarding (1/2)
Financial Information Processing (1)
5-Unit Job Preparation Sequence
Introduction to Occupations (1)
Business and Marketing Core (1)
Business Analysis/Business Computer Applications (1/2) (1/2)
PLUS (two units from):
Accounting (1)
College Accounting (1)
Advanced Accounting (1)
Principles of Marketing (1)
Business Ownership and Marketing (1)
Electronic Information Processing (1)
Advanced Electronic Information Processing (1)
Cooperative Work Experience (1)
Business Communications (1)
Financial Information Processing (1)

3-Unit Exploratory Sequence

Introduction to Occupations	(1)
PLUS (two units from):	
Keyboarding/Keyboarding Applic.	(1/4) (1/4)
Business Analysis/Business Computer Applications	(1/2) (1/2)
Accounting I	(1)
College Accounting	(1)
Business Law	(1)
Principles of Marketing	(1)
Business Ownership and Marketing	(1)
Personal Use Shorthand	(1/2)
Personal Business Management	(1/2)
Financial Decision Making	(1/2)

5- or 6-Unit Job Preparation Sequence

Introduction to Occupations	(1)
Business and Marketing Core	(1)
Shorthand - Transcription	(1,2)
Electronic Information Processing	(1)
PLUS (one unit from):	
Advanced Electronic Information Processing	(1)
Business Analysis/Business Computer Applications	(1)
Business Communications	(1)
Financial Information Processing	(1)

INTRODUCTION TO OCCUPATIONS: Working Citizen (1/4), Personal Resource Management (1/4) and any other 2 Introduction to Occupations modules.

BUSINESS/MARKETING CORE: Keyboarding (1/4), Keyboarding Applications (1/4), Basic Communications (1/4), PLUS ONE FROM - Information Technology (1/4), Introduction to Keeping Business Records (1/4), Visual Communications (1/4), Human Relations/ Decision Making (1/4), Economics of Work (1/4) if not taken in Introduction to Occupations.

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